

NPDES CAFO NMP Nine Minimum Practices Review Checklist

Part A Basic Facility Information

Documents location information and basic information about the type and size of the operation.

Part B Nine Minimum Practices

Documents critical information specific to each of the NMP nine minimum practices, including information associated with or necessary to review how the plan addresses each practice.

Part C Plan Adequacy

For use by the plan reviewer to document an overall determination of plan adequacy.

Part A – Basic Facility Information

1. Facility Identification

- Operation Name: Four Brothers Dairy
- NPDES permit number: IDG010000

2. Plan Preparer Certification

- Did the plan preparation involve certified technical specialists? ☒ Yes ☐ No
- Are the name and certification credentials of the plan preparer identified in the plan? ☒ Yes ☐ No

3. Type of Operation

- Is the operation ☒ Large CAFO ☐ Medium or Small CAFO ☐ Other (non-CAFO)
- Is the operation ☒ Open lot ☐ Partially enclosed ☐ Fully enclosed

Notes: 11,500 milking cows, 1,200 dry cows, 200 bulls, and 9,750 replacement calves, bulls, and heifers
[pg. 19]

- Does the description of the facility in the plan reflect the description of the facility in the application/NOI/fact sheet/permit? ☒ Yes ☐ No

Notes: Facility type matches.

4. Facility Location

- Street Address (mailing): 425 N 250 W
- City, State, ZIP: Shoshone, ID 83352
- Does the plan include maps that identify

- (1) The location of the production area, including confinement areas, manure and wastewater handling and storage areas, and raw material handling and storage areas? ☒ Yes ☐ No
- (2) All land application areas owned or under the ownership, rental, lease, other legal arrangement of the CAFO operator, including topography and soil types? ☐ Yes ☒ No

The NMP does not include maps that show topography; this is requested in form 2B but not explicitly required by the permit.

- (3) Environmentally sensitive areas (sinkholes, wells, drinking water sources, tile drain outlets, etc.) for the production and land application areas? ☐ Yes ☒ No

The maps on pages 8-19 do not clearly label these areas. However, the soil maps label sinkholes and the Conservation Practices section [pg. 35] identifies fields with buffers and setbacks, but does not specify what features are being protected (e.g., from what waterbody or sensitive area land application will be set back).

- Does the plan identify the latitude and longitude to the entrance of the production area? ☒ Yes ☐ No

Map on page 8 includes coordinates near the entrance; the NMP also lists the coordinates of each barn.

- Does the plan identify the watershed(s) in which the operation is located? ☒ Yes ☐ No

- Is the watershed listed on the state's list of impaired watersheds? ☒ Yes ☐ No

If yes, what impairments are identified? Big Wood Hydrologic Unit #17040219 near the Big Wood River:

Bacteria, Dissolved Oxygen, Flow Alteration, Nitrates, Nutrients, and Sediment

- Is this facility located in a state-designated source water protection area? ☐ Yes ☒ No

Are there any other water quality concerns in this watershed? ☐ Yes ☒ No

Explain: None identified in the NMP.

5. Animals

- What type(s) of animals are confined at the facility?

☐ Beef (slaughter/feeder)

☐ Chicken – Layer

☒ Dairy

☐ Chicken – Broiler

☐ Swine

☐ Sheep/Lambs

☐ Turkey

☐ Horse

☐ Duck

☐ Other _____

- What is the maximum number of animals confined, by animal type?

☐ Beef (slaughter/feeder) _____ ☐ Chicken – Layer _____

☒ Dairy 22,650 per NMP facility description, 20,559 per application form 2B

☐ Chicken – Broiler _____

☐ Swine _____ ☐ Sheep/Lambs _____

☐ Turkey _____ ☐ Horse _____

☐ Duck _____ ☐ Other _____

- Is the plan based on the animal numbers listed above? ☒ Yes ☐ No

If no, on what capacity is the plan based? _____

Part B – Nine Minimum Practices

1. Minimum Practice: Ensure Adequate Storage Capacity

Manure/Litter/Process Wastewater Generation

- What are the manure generation rates identified in the plan?

The NMP states it is designed for: 11,500 milking cows (@1300 lbs), 1,200 dry cows (@1300 lbs), 200 bulls (@1500 lbs), and 9,750 replacement calves, bulls, and heifers (bottle calves @ 200 lbs, weaned heifers @ 400 lbs, open heifers @ 500 lbs, bred heifers @ 850 lbs, replacement bulls @ 650 lbs)

AWM calculates approx. 2,200,000 lbs manure/day (~400,000 tons/year), which is roughly consistent with annual manure generation in NMP (~375,000 tons/year).

- Are the manure generation rates generally consistent with the USDA's Agricultural Waste Management Field Handbook? ☒ Yes ☐ No

If no, are other practices in place that account for the rates included in the plan? ☐ Yes ☐ No

If yes, what are the practices identified in the plan? ☐ Feed Management ☐ Other

Explain: _____

- Does the plan identify all sources of process wastewater and appropriate generation rates? ☒ Yes ☐ No

The permit application [item 5.4] indicates 92,179,688 gallons of process wastewater are generated annually. The Parlor Descriptions section of the NMP [beginning on pg. 19] describes process wastewater sources and volumes.

Total volume of storage structures listed in NMP Table A-2 [pg. 4] is approx. 122.2 million gallons

Storage Capacity

- Does the plan identify the volume and number of days of storage required for the facility? ☒ Yes ☐ No

- Does the plan identify the size (in acres) of the production area? ☒ Yes 685 acres ☐ No

From individual runoff area descriptions on pages 22 – 26: Barn 1 Area = 68.5 acres; Heifer Area = 58.6 acres; Barn 3 Area = 142 acres; Barn 2 Area = 64 acres; Barns 4&5 Area = 352 acres

- Does the plan identify the number and type of storage structures? ☒ Yes ☐ No

- Does the plan document the source of the information to calculate available storage volume? ☒ Yes ☐ No

Appendix B

- Does the storage volume in the plan account for manure and process wastewater generation (including silage leachate and other wastes) during the storage period in addition to the collection of runoff and direct precipitation on the surface of the storage structure from normal precipitation and the design storm event (25-year, 24-hour storm or other as required/appropriate for new source swine, poultry, and veal calf operations) for the CAFO location, a minimum treatment volume for anaerobic lagoons, and volume for solids accumulation? ☒ Yes ☐ No

Plan appears to account for sources of wastewater, but calculations of runoff volume do not account for impervious areas. All acres are calculated as earthen site (curve number 80.3 versus curve number 100 for roofs and concrete areas in the AgTec worksheets). The volume of runoff from both normal precipitation and the 25-year, 24-hour storm therefore may be underestimated.

For solid manure, the storage capacity appears to be adequate based on the information in the NMP, but the permit application form 2B indicates a much higher volume of manure is generated than is stated in the NMP (see notes below).

- Does the plan use the correct 25-year, 24-hour rainfall amount for the location of this operation to determine storage requirements (or other storm event as required/appropriate for new source swine, poultry, and veal calf operations)? ☒ Yes ☐ No

Note source of information: 2 inches used in AgTec lagoon sizing sheets (Appendix B); confirmed using WRCC Western U.S. Precipitation Frequency Maps (NOAA Atlas 14 data not available online)

- Are the evaporation rates used in the plan consistent with local data/guidance and appropriately applied? ☒ Yes ☐ No

Evaporation (2.1 in.) approx. 25% of annual precip (8.32 in.), appears consistent with AWMFH Table 10C-1

- Does the plan include a schedule for cleaning out the storage structures or solids removal for liquid storage structures? ☐ Yes ☐ No ☒ Unknown

AgTec lagoon sizing sheets (Appendix B) indicate 5 years between solid sludge cleanout; however, these sheets are estimating required storage volume for drainage areas including multiple storage structures some of which (e.g., separators) are likely cleaned out more frequently than others. The reviewer did not find pond-specific clean-out schedules in the NMP.

- Does the plan document that available storage volume is consistent with the plan's specified land application schedule? ☐ Yes ☒ No

The plan doesn't include a specific land application schedule, but states that wastewater is land applied generally before planting and after harvest [pg. 20]. Assuming the growing season is, on average, April through September, the storage calculations based on a 180-day storage requirement suggest that the available storage volume is consistent with the land application schedule.

- Does the plan require maintenance for all storage structures? ☐ Yes ☒ No

The NMP includes a subsection titled Liquid Storage Operations and Maintenance [pg. 26], but this section only describes the status of lagoon construction/liner evaluations. The Record Keeping Requirements section [pg. 5] contains the permit language requiring visual inspections and corrective actions (copied and pasted from the permit, including internal permit section references to language that does not exist in the NMP). The reviewer did not find specifications or a plan for maintaining storage structures.

The permit specifies CAFOs must ensure proper O&M of storage structures by confirming compliance with NRCS Appendix 10D and IDAPA 02.04.14.030.01 or using WA NRCS Tech Note #23. The NMP Liquid Storage Operations and Maintenance [pg. 26] does not explicitly state that any of the wastewater and manure storage structures meet the NRCS and IDAPA specifications, but does state that two of the structures have not been evaluated and that documentation of pond evaluations is not available for several others. Until the pond construction documentation is obtained for all structures, the facility would be out of compliance with the permit, if issued.

- Does the plan identify the specific maintenance actions and a frequency/schedule for those actions? ☐ Yes ☒ No

Notes: Ensure Adequate Storage Capacity

Solid manure

Solid manure (@65% moisture) + bedding generation: 130,000 tons/year [pg. 27]; the permit application indicates 400,968 tons/year of manure generated [item 5.4] and 352,851 tons transferred off site [item 5.9]

Solid manure and compost storage capacity: total 288,000+ tons

- Barn 3 composting area: 68,000 tons [pg. 24]
- Barn 4 composting areas: 118,000 tons [pg. 26]
- Barn 4 manure stacking area: 102,000 tons [pg. 26]
- Additional capacity (not quantified) in corrals

Solid manure storage and removal: Manure is spread and dried in corrals (including manure from concrete aprons, feed lanes, etc.) during summer and fall; removed to fields or manure stacking area in fall; corrals bedded with straw in winter and spring, removed as needed to composting or manure stacking areas for composting in spring – fall [pg. 21]

Liquid manure/wastewater

- Conveyance: "Lagoon 1 overflows through a pipeline suspended over the canal into Barn 1 lagoon 2." [pg. 22]; "Andys Pond 2 is connected to the Barn 2 Containment system with a pipeline that is suspended above the canal." [pg. 22]; "Pond 3 is connected to Barn 4 Pond 4 via a suspended pipeline over the canal." [pg. 25].
- In the Barn 2 runoff area, depth markers will be placed in the two terminal ponds, Barn 2 Lagoon 2 and Barn 2 East Pond 1 [pg. 25]. (Note that the NMP states that "Barn 2 Lagoon 2 and **Barn 3** East Pond 1 will be utilized for the 25 yr 24 [sic] storm volume" but the reviewer assumes this is a typographical error as the East Ponds are only in the Barn 2 area; there is no Barn 3 East Pond 1 on the maps or elsewhere in the facility description.) The NMP states, "When ponds are being pumped for land application, water will be transferred via pump from the east ponds 4, 3 and 2 into East 1. This may temporarily impact the 24 year volume in Pond 1 but that volume would have been made available in the other ponds for that temporary period and will be documented in the facility records." It is not clear, however, what specific information will be documented to show that East Ponds 2 – 4 maintained sufficient volume for the 25-year, 24-hour storm. The East Pond system receives runoff from the corrals in the northeast corner of the Barn 2 runoff area; otherwise wastewater is pumped to the East Ponds, which overflow in series from Pond 4 to Pond 1. If, for example, East Pond 4 were to discharge as the result of precipitation during a land application event when the other ponds had been pumped to Pond 4, the records would need to include sufficient information to demonstrate 1) how much storage capacity was available in Ponds 1 – 4 before the precipitation, and 2) that the available capacity was sufficient to store the runoff volume from a 24-year, 24-storm.
- The NMP states that the Barn 1 Separator Pond and Barn 1 Lagoon have not yet been evaluated to verify pond and liner integrity and will need to be evaluated "as part of this permit period." [pg. 26]. The NMP does not include documentation of all pond evaluations (for liner integrity) that have been completed; the NMP states that some of the evaluations are unreadable and will be added or updated later. The permit requires the NMP to include confirmation of compliance with NRCS Appendix 10D and IDAPA 02.04.14.030.01 or use of WA NRCS Engineering Tech Note #23 as a condition of compliance (i.e., prior to permit coverage, not during the permit term). Based on this, it does not appear that the facility meets the requirements in III.A.2.a.ii of the permit.

2. Minimum Practice: Ensure Proper Management of Mortalities

- Is the animal mortality addressed in the plan? ☒ Yes ☐ No
If yes, what methods are identified in the plan to address animal mortality?
☒ Rendering ☐ Incineration ☐ Composting ☐ Disposal pits
☒ Landfill ☐ Other _____
- Does the plan include a schedule for collecting, storing, and disposing of animal carcasses? ☒ Yes ☐ No
- Does the plan address mortality storage before final disposition? ☒ Yes ☐ No
The NMP states that mortalities are stored at the pickup location southeast of Barn3 Pond4 [pg. 40]. However, it is not clear if that impoundment also captures the runoff from the mortality storage/pickup location or if runoff would drain to another part of the production area. Based on the maps and runoff area descriptions, it appears that runoff from this area would flow into the composting area, which drains to the Barn 3 Compost Pond. The NMP states that the temporary mortality storage area is "far from any surface water resources" but does not confirm that runoff from the area is captured and handled as process wastewater.
- Is the mortality rate used in the plan consistent with USDA expected values for the animals confined at the operation? ☐ Yes ☒ No
The NMP does not specify a mortality rate.
- Does the plan include contingency plans for unexpected but possible occurrences such as mass mortality or the loss of a rendering contractor? ☒ Yes ☐ No
The facility will contact ISDA for guidance [pg. 40]. Otherwise, the facility will haul mortalities to a landfill.
- Does the animal mortality plan meet state and local requirements? ☐ N/A ☐ Yes ☐ No
Did not evaluate state and local requirements.

Notes for Minimum Practice: Ensure Proper Management of Mortalities
 See notes for specific questions above.

3. Minimum Practice: Divert Clean Water From Production Area

- Does the plan address the diversion of clean water from the production areas? ☒ Yes ☐ No

The Waste System Descriptions and Runoff Areas section [pg. 25] of the NMP specifies that a diversion ditch is located on the north side of the Barns 4&5 composting area which prevents "...off site runoff from the north or east from entering the site." In addition, the Emergency Management Plan section [Appendix G, pg. 162] of the NMP describes a berm and trench on the northside of the facility that is used to "...divert run on...back to the northwest away from the dairy facility."

If no, why? _____

If no, is the runoff being collected and is storage of runoff adequate?

(See the Minimum Practice: Ensure Adequate Storage Capacity section) ☐ Yes ☐ No

- Does the plan require periodic visual inspection to verify proper and functional diversion? ☒ Yes ☐ No

The NMP includes general language from the permit, it is not site-specific.

- Does the plan address the maintenance of diversion structures? ☐ Yes ☒ No

Contains general permit language regarding inspections of storm water diversion devices, it is not site-specific.

Notes for Minimum Practice: Divert Clean Water From Production Area
 See above.

4. Minimum Practice: Prevent Direct Contact

- Does the facility or topographic map identify any surface water in the production area? ☒ Yes ☐ No

- If yes, are measures in the plan to prevent direct contact? ☐ Yes ☒ No

The canal does not flow through any confinement areas.

- What are the measures identified in the plan? ☒ Fences ☐ Other

Corrals are adjacent to the irrigation canal, but the does not flow through the confinement areas.

- Does the plan address maintenance of the identified practices? ☐ Yes ☒ No

Notes for Minimum Practice: Prevent Direct Contact (identify below or reference NMP section(s)):
 See above.

5. Minimum Practice: Chemical Disposal

- Does the plan include practices that ensure chemicals (including pesticides, hazardous and toxic chemicals, and petroleum products/by-products) are not disposed of in any storage or treatment system that is not specifically designed to treat those chemicals? ☒ Yes ☐ No

The NMP [pg. 40 – 41] discusses chemical handling and management; however, the practices included are not site specific. For example, the NMP does not specify where chemicals are stored and handled, whether those locations are near sensitive areas (wells, water supplies, or the irrigation canal), and if so, what specific BMPs are in place to protect those areas.

- Has the facility incorporated measures (in accordance with applicable laws and regulations) to prevent mishandling of pesticides, hazardous and toxic chemicals, and petroleum products/by-products? ☐ Yes ☒ No

If no, explain: The NMP includes generic language with regard to handling and disposal of chemicals.

Notes for Minimum Practice: Chemical Disposal

The NMP language on Chemical Handling and Management is general and does not identify specific measures that this facility takes to dispose of chemicals and prevent chemicals from entering storage or treatment systems.

6. Minimum Practice: Conservation Practices to Reduce Nutrient Loss

- Does the plan specify a 100-foot setback or a 35-foot vegetated buffer or alternative setback for land application from down gradient surface waters and conduits in accordance with the Effluent Limitations Guideline?..... ☐ N/A ☒ Yes ☐ No
 - The NMP Cropping Plan section [pg. 33] identifies the fields to be used for liquid manure application and the conservation practices section describes implementation of 100-foot setbacks or 35-foot vegetated buffers for those fields, as applicable. With the possible exception identified below for Barn 3 Pivots 1 – 5, those descriptions appear to adequately address the permit requirement for land application setbacks or compliance alternatives for liquid manure applications.
 - The NMP states “...Barn 3 Pivots 1 – 5... have and will maintain a 100 ft setback from waterways” but does not identify specific waterways [pg. 36]. The field maps [pg. 12] and review of Google Maps and Google Earth indicate presence of an unnamed drainage that transects Barn 3 Pivots 1, 2, and 3. Based on topographic maps of the area, the drainage appears to be an irrigation lateral that carries flow away from the North Gooding Canal. If, however, the drainage is actually tributary to the North Gooding Canal, it is not clear based on the NMP descriptions how a setback from this drainage would be maintained. If the NMP is referring to a different waterway, it is not clear which waterway a setback will be maintained from.
 - The NMP states, “...The Silva Pivots will utilize a vegetative buffer of 35 ft from the big wood river [sic] that runs between the pivots. The far west silva wiper will limit liquid applications to the east half of the pivot to maintain a 100 ft buffer as this pivot is within 35 ft on the west side.” The field maps show only one field labeled “Silva,” [pg 12]; based on review of area maps, the three adjacent unlabeled fields are those described in the Conservation Practices section [pg. 36, excerpted above].
 - The NMP [pg. 36 – 37] states that any field may be used for solid manure application. The NMP generically states that the Big Wood River flows adjacent to several fields and that either a 35-foot vegetative buffer or a 100-foot setback would be maintained if solid manure is applied to those fields. This does not appear to meet the requirement to identify site-specific conservation practices, as it does not identify the specific fields where setbacks are required and does not clarify which type of practice (a setback or vegetated buffer) would be used for each.
 - Similarly, the NMP generally states that “Many fields have drain ditches that flow adjacent to the field or through the field” and describes how setbacks will be implemented in those fields [pg. 36 – 37], but doesn’t specify which fields require setbacks from drain ditches. Further, the setback protocols do not meet the permit requirements, assuming that drainage ditches meet the definition of “surface water” as used in the permit. The NMP states that, for ditches with flowing water, a 15-foot setback will be maintained if the operator plans to incorporate the manure within 7 days and a 35-foot setback (not a vegetated buffer) will be maintained if the manure will be incorporated within 7 – 14 days. For dry ditches (no flowing water at the time of land application), the NMP specifies a 15-foot setback for dry manure applications. These are not presented as alternative setbacks and the NMP does not demonstrate that they will provide equivalent or better pollutant reductions than the 100-foot setback or 35-foot vegetated buffer specified in the permit.

If an alternative setback has been specified, what is the basis for the use of an alternative setback?

See the discussion above regarding setbacks from drainage ditches. In addition, the includes language about the potential for evaluating existing field berms to “receive credit” for this BMP in the Phosphorus Index calculations (discussed in more detail below). To the extent that the facility might also consider

these berms to be a viable compliance alternative to the 100-foot setback requirement, the facility should note the permit requirement (section II.B.8.b) to demonstrate that the alternative will provide equivalent or better pollutant reductions.

- Does the plan include the use of best management practices (BMPs) to control nutrient loss from the:
 Production Area ☐ N/A ☐ Yes ☒ No
 Land application area(s) ☐ N/A ☒ Yes ☐ No

The Conservation Practices section of the NMP [pg. 36 – 37] identifies several practices used to control nutrient loss from land application areas, in addition to land application setbacks and vegetated buffers. No BMP credits are included in the P Index calculations.

If yes, identify:

Land Application Areas

- ☒ Vegetated Buffers (Type of vegetation: Not specified)
- ☐ Diversion
- ☐ Grassed Waterway (Type of vegetation _____)
- ☐ Strip Cropping
- ☐ Residue Management
- ☐ Terracing
- ☐ Conservation Tillage

Production Area

- ☐ Vegetated Buffers (Type of vegetation _____)
- ☐ Other _____

☒ Other: Sprinkler irrigation to minimize runoff (entire farm); crop rotation; cover crops ("where possible"); no application on frozen, snow covered, or saturated soils or when such conditions are predicted.

- If BMPs are being used to control nutrient loss, does the plan specify how they are to be implemented? ☐ Yes ☒ No

If yes, what does the plan require?

- What references are cited for the practices? ☐ USDA Practice Standards ☐ State Standards
☐ Other _____ (Note: To be used to verify proper implementation)

No references are cited, or implementation schedules or O&M procedures included, for the identified conservation practices. This appears to be inconsistent with the permit requirement in section III.A.2.f.

- Does the plan include Operation & Maintenance requirements for practices used to reduce nutrient loss? ☐ Yes ☒ No
- Do the plan and facility maps identify the specific locations where the BMPs and setbacks are to be used? ☐ N/A ☐ Yes ☒ No

Notes for Minimum Practice: Conservation Practices to Reduce Nutrient Loss

The permit requires that the NMP identify site-specific conservation practices and include operation and maintenance procedures for NRCS conservation practice standards in accordance with the specific NRCS standard. If alternative practice standards are used, the NMP "must describe and cite those standards so that EPA can perform an adequate review. In addition, the NMP must include a schedule for implementation of site-specific conservation practices and proper operation and maintenance procedures." As described above, the NMP identifies several conservation practices but in general they are not site-specific. Further the NMP does not include the details (practice standards, implementation schedules, and O&M procedures) required by the permit.

7. Minimum Practice: Protocols for Manure and Soil Testing

- Does the plan include specific protocols for the representative *sampling* of manure, wastewater, and soil for determining nutrient content? ☒ Yes ☐ No

The NMP includes U of I Manure Sampling Protocol CIS 1139 [pg. 126, Appendix D] and states that the protocol "or industry practice" will be used in manure sampling and analysis. The NMP specifies manure sampling and analysis prior to land application and identifies the parameters to be analyzed [pg. 32-33].

- Does the plan include appropriate frequencies for the *sampling* of manure, wastewater, and soil for determining nutrient content? ☒ Yes ☐ No

The NMP specifies that manure samples taken within the last 9 months must be utilized to determine actual application rates [pg. 30]. The Manure Sampling and Laboratory Analyses (Testing) section [pg. 32] specifies that manure, organic by-products, and biosolids must be sampled and analyzed at least annually. The Soil Sampling Protocol section uses the permit language to specify that soil must be analyzed annually [pg. 34].

- Does the plan include specific protocols for the *analysis* of manure, wastewater, and soil for determining nutrient content? ☒ Yes ☐ No

The permit requires manure samples to be tested "for nitrogen and phosphorus content in accordance with the University of Idaho Manure and Wastewater Sampling CIS 1139." The U of I guidance identifies essential analyses to include NH₄-N, TKN, and TP; the NMP requires testing for TN, NH₄-N, TP, and P₂O₅ [pg. 32]. Theoretically, the TKN test would be needed to accurately determine the organic nitrogen content because TKN excludes nitrate; however, in practice TKN is treated as equivalent to TN because dairy manure typically contains minimal nitrate. The NMP protocols appear to satisfy the permit requirement.

The permit requires manure samples to be analyzed "by a certified Manure Analysis Proficiency Laboratory." The NMP states that manure analyses must be performed by "laboratories successfully meeting the requirements and performance standards of the Manure Testing Laboratory Certification program (MTLCP) under the...auspices of the Minnesota Department of Agriculture, or other NRCS-approved program that considers laboratory performance and proficiency to assure accurate manure test results." [pg. 33]. The NMP protocols satisfy the permit requirement; MTLCP is the lab certification program under the Manure Analysis Proficiency program.

For soil analyses, the NMP includes permit language requiring testing of every field to be used for land application, required analytes, and use of an NAPT-certified laboratory [pg. 34].

- Are the soil test results used to develop the plan less than 5 years old? ☒ Yes ☐ No

The NMP includes soil test phosphorus for each field in the phosphorus risk index results and provides an example soil report dated 10/6/2020 for a single field [Appendix A], but does not include all soil analysis results for each field. The NMP indicates that the phosphorus index was run using 2020 soil sampling results [pg. 32]. The NMP also states that soil samples must be collected and analyzed annually and that the results must be included in the NMP and used in calculating application rates [pg. 34]. Although the results of the soil samples are not included in the NMP, it appears that current soil test results were used to develop the plan.

- Are the manure nutrient analysis results used to develop the plan less than 12 months old? . ☐ Yes ☒ No
[Note: book values may be used for the first year of operation.]

The NMP includes manure test results for manure applied on the farm in 2017 [Table A-3, pg. 30]. However, the NMP specifies annual manure testing and use of manure testing results no more than 9 months old to determine actual application rates [pg. 30].

Notes for Minimum Practice: Protocols for Manure and Soil Testing

The NMP [pg. 32] states "Currently the facility is predominately converting all the open lot corral manure to compost for export or application. It is **recommended** to sample compost that is finished before land application to best determine the nutrient content of the compost *[emphasis added]*." In fact, if the facility is land-applying composted manure, it is **required** that the land application rates are based on the nutrient content of the finished compost. The next section on the same page (Manure Sampling and Laboratory Analysis (Testing)), states that "Nutrient values of manure, organic by-products and biosolids must be determined prior to land application," and the permit specifies use of current manure samples (with manure defined as including compost). However, the statement quoted above ("It is recommended...") creates confusion about whether the facility is required to sample finished compost before land application.

8. Minimum Practice: Protocols for Land Application of Manure and Wastewater

Manure, Litter, and Process Wastewater Use and Disposal

- What manure utilization options are identified in the plan? (If more than one option is identified in the plan, indicate the relative amount of the manure used or disposed of under this option.)
 - ☒ Land Application Unknown%
 - ☒ Composting Unknown%
 - ☐ Incineration %
Does the plan address what is done with the remaining ash? _____
 - ☐ Other %
Describe: _____

- Is manure, litter, or wastewater to be transferred off-site? ☒ Yes ☐ No

If yes:

How much will be transferred annually? Not provided tons Not provided gallons

The Third Party Export section of the NMP [pg. 37] states that "any excess manure generated by the facility will be exported to third party receivers" and identifies the number of acres of each third party receiver has available for manure application. The NMP states that "The facility has exported all of its solid manure for the last 2 plus years" (approximately 66,000 tons/year @35% moisture), but does not specify the amount that will be transferred annually. In the Land Application Site Assessment section, the NMP also states that, in order to reduce soil phosphorus levels, the dairy has "...exported nearly all its manure for the past two seasons" [pg. 34]. The NMP implies that solid manure and/or compost will be used on site if possible, and the amount that cannot be used will be transferred.

Does the plan include the necessary arrangements for that transfer? ☒ Yes ☐ No

The NMP includes the permit language for requirements that must be met for transfer of manure, litter, and process wastewater, and states that "The facility has adequate capacity to store and haul dried manure or compost with third parties are wanting to receive these products." [pg. 39]. Other sections of the plan specify the available storage capacity for solid manure and compost (see Part B, Item 1 above).

Does the plan identify the recipients? ☒ Yes ☐ No

The NMP includes a list of third party receivers, along with addresses and available acres for manure application [pg. 37].

- If the plan includes land application of manure, litter, or process wastewater:
 Do the facility maps identify the fields or conservation management units (CMU) used to develop the plan? (Field boundaries, field number, acreage) ☒ Yes ☐ No
 Does the plan address rates of application using the ☐ linear approach or the ☒ narrative rate approach?

[Note: The linear and narrative rate approaches primarily influence identification of terms based on the NMP and generally do not dictate the content of the NMP, with a few specific exceptions. The questions in the sections below identify specific information that is required to support development of terms under the narrative rate approach.]
- How many acres under control of the CAFO (e.g., owned, leased, subject to an access agreement) are identified in the plan for land application use?
 3,226 acres owned *[source: NMP pg. 33]*
 unknown acres leased *The NMP [pg. 33] mentions "trading" farm ground with neighbors but does not indicate that the dairy leases land application areas.*
 3,065 total acres applied *[source: permit application item 5.6]*
- Does the CAFO own or control sufficient land to properly use all manure and wastewater generated by the operation? ☐ Yes ☐ No ☒ Unknown

As stated above, the Land Application Site Assessment section of the NMP indicates that in recent years the dairy has been exporting nearly all its solid manure to manage soil phosphorus levels [pg. 34], which suggests that the available land under the facility's control is insufficient to properly use all solid manure generated. However, as described above, the plan clearly identifies off-site transfer as a viable means to manage excess solid manure.

Based on the information available in the NMP, it is not clear whether the facility controls sufficient land to properly use all wastewater generated by the operation. The NMP [pg. 33 and 36] identifies more than 13 fields to be used for liquid waste application (both sections refer to "Silva Pivots" in the plural but do not specify the number of fields called "Silva Pivots" and only one field is labeled "Silva" on the facility maps [pg. 12] though several other unlabeled fields are adjacent). Appendix A includes P Index results for 10 of these liquid application fields (P Index results for Barn 3, pivots 2 – 4 are not included and there is only a single result for "Silva" with acreage corresponding the single field shown on the maps). Six of those 10 are phosphorus-limited. The Silva Pivot, Hubbs, Sandy North and Sandy South all have a medium risk rating, meaning that P applications are limited to the crop removal rate or soil test-based P application recommendations. The East Pivot and East Half Swing have a high P Index risk rating, meaning that P application is limited to 50% of crop uptake.

The reviewer used the information available in the NMP to estimate the maximum potential assimilative capacity for the 13 liquid application fields identified in the NMP (calculations in Excel sheet provided separately).

The analysis indicates that the liquid waste application sites could receive approximately 128.5 million gallons of wastewater per year. The permit application [item 5.4] indicates 92,179,688 gallons of process wastewater are generated annually.

This rough analysis suggests that the facility has sufficient land to utilize the wastewater generated. However, the analysis intentionally errs on the high side with regard to the amount of wastewater that can be applied per year (see assumptions below); a change in the type of crop could dramatically decrease the estimated volume of wastewater that could be applied (e.g., the same analysis using uptake rates for triticale results in an estimated 67.7 million gallons of manure that could be land applied

Assumptions for rough estimate of maximum annual wastewater application:

 - *All fields planted to corn silage (corn silage has the highest crop P uptake of all the crops identified in Table A-C1 [pg. 33]): P uptake = 155.8 lbs P₂O₅/acre;*
 - *For fields with low P Index rating, wastewater applied to meet full N uptake for 30 tons of yield (no N credits) based on Table A-C1 = 233 lbs available N/acre*
 - *Acreage per field as shown in the NMP field maps [pg. 12 & 13]*
 - *Average nutrient content for the four lagoons shown in Table A-4 [pg. 30]:*
 - *P₂O₅: 14.4 lbs/1,000 gallons (range: 7.5 – 25 lbs/1,000 gallons)*
 - *Available N: 0.9 lbs/1,000 gallons (range: 0.6 – 1.2 lbs/1,000 gallons)*

If no:

Does the plan identify the quantity of excess manure being generated? The plan does not discuss offsite transfer of wastewater. For solid manure/compost, the plan does not explicitly quantify the amount of excess manure that will be transferred, but does provide the approximate quantity transferred in the prior two years (66,000 dry tons/year) and states that amount was "all" [pg. 37] or "nearly all" [pg. 34] the solid manure generated in those two years.

Does the plan identify how the excess manure is to be used? ☒ Yes ☐ No

If yes, how? The manure would be exported to third party receivers.

Notes for Minimum Practice: Protocols for Land Application of Manure and Wastewater; Manure, Litter, and Process Wastewater Use and Disposal

See above.

Crop Production Information

For use where the NMP includes land application of manure, litter, or process wastewater

- Does the plan identify what crops are produced for each field? ☐ Yes ☒ No

The NMP includes Table A-C1 which shows the crops that "have been and are expected to be grown on the farm over the next permit cycle." [pg. 33]. The NMP does not specify which crops will be grown in each field or identify field-specific yield goals, etc. The Conservation Practices section [pg. 35] states that triticale, alfalfa, and wheat are the winter crops used as cover on some fields, but does not identify the specific fields where cover crops are planted.

- Does the plan identify the crop rotations? ☐ Yes ☒ No

The NMP states that the facility "maintains a diverse cropping rotation" [pg. 33] and "employs a cropping rotation to maintain soil tilth and build soil organic matter" [pg. 35], but does not further describe the rotation. The NMP also states, "The farms [sic] planned or typical crop rotations are listed at the end of this plan and will typically be used." However, the reviewer did not find information on the typical rotations for specific fields in the NMP.

Does the plan identify cropping practices? ☐ Yes ☒ No

If yes, what are they? ☐ Ridge Till ☐ Conservation Tillage ☐ Contour Farming
☒ Other: cover crops, "where possible" [pg. 35]

- Does the cropping system use irrigation? ☒ Yes ☐ No

If yes, what type: ☐ Traveling Gun ☒ Center Pivot
☐ Flood ☒ Other Sprinkler
☐ Ridge and furrow ☐ Other _____

The NMP states that the entire farm is sprinkler irrigated [pg. 35]. Many fields are characterized as pivot fields, but it is not clear whether other types of sprinkler irrigation are used.

- For plans using the narrative rate approach, does the plan identify alternative crops for specific fields? ☒ Yes ☐ No

By including a list of crops that may be grown on any field [Table A-C1] without specifying field-specific cropping plans or rotations, the NMP treats all crops as alternative crops.

- Are realistic crop yield goals identified in the plan (including for alternative crops, if included in plans using the narrative rate approach)? ☐ Yes ☐ No ☒ Unknown

Section II.B.2 of the permit requires that the NMP address the form, source, amount, timing, and method of application of nutrients on each field to achieve realistic production goals [emphasis added] ... This language is also included in the NMP [pg. 6]. Table A-C1 includes yield goals for the typical crops grown on the farm; however, the yield goals are not field-specific and the basis for the yield goals is not specified. In

addition, the yield goal used in the Example Nutrient Budget [Appendix A, pg. 52] does not match the yield goal in Table A-C1. The Example Nutrient Budget is for field Dairy East; the planned crop and yield goal are listed in the soil sample analytical report [pg. 53], which identifies a yield goal of 38 tons/acre for corn silage; Table A-C1 shows a yield of 30 tons/acre for corn silage. For reference, 2018 NASS data for irrigated corn silage yield suggests suggest a statewide average yield of 30 tons/acre (county-level data for irrigated corn silage are not published for Idaho). Because the basis of the yield goals, or what specific yield goals will be used, is not known, it is not possible to determine whether the yield goals are realistic.

- What source of information was used to determine the realistic yield goals for this operation? Unknown
 - ☐ Farm records (Circle one: last year's crop production, 3-year average, 5- year average, Other: _____)
 - ☐ USDA ☐ State databases (VALUES, MASCAP)
 - ☐ County averages ☐ Previous crop insurance records
- Is adequate justification provided to support the yield goal? ☐ Yes ☒ No

Notes for Minimum Practice: Protocols for Land Application of Manure and Wastewater; Crop Production Information

The NMP does not identify crops for each field, the crop rotations, nor the field-specific cropping practices. The plan provides yield goals, but the basis for those yield goals is not clear and the yield goal used in the Example Nutrient Budget calculation is more than 25% higher than the yield goal listed in the plan for the same crop.

Rate Determination/Nutrient Application Information

For use where the NMP includes land application of manure, litter, or process wastewater

- Does the plan clearly identify field-specific maximum application rates, as follows:
For plans using the narrative rate approach, the maximum pounds of N and P from all nutrient sources per crop, per year? ☐ Yes ☒ No

The NPDES permit requires that the NMP include "annual nutrient budgets... generated to determine land application rates for each field [emphasis added] where manure, litter, or process wastewater is applied." These budgets must be developed "in accordance with the University of Idaho Fertilizer Guides or related University of Idaho Crop Production Guide." In addition, "The NMP must express land application rates of nutrients in pounds per acre; and volume of manure, litter, and process wastewater in tons, gallons or cubic feet... The NMP developed to meet the requirements of this permit, and submitted to the permitting authority for review, must include all necessary calculations [emphasis added]. Thereafter, for the remainder of the permit term, application rates may be calculated annually, or immediately prior to land application, if all data and calculations are appropriately documented in the NMP."

Tables A-5a1, A-5b, A-5a3, A-5a4, and A-5a5 in the NMP [pg. 31 - 32] provide application rates for different nutrient sources (in inches/acre for wastewater and tons/acre for solid manure) applied to different crops, but the information is not field-specific. The tables also include columns showing Total N (lbs) and lbs/acre Available N and P₂O₅. Those columns appear to represent application rates, consistent with the table titles; however, they are presented, along with the inches or tons/acre column in each table, under an overall table heading labeled "Crop P₂O₅ Uptake Rates" so it is not clear whether they represent application rates, though uptake rates for specific crops would not be expected to vary based on the nutrient source and the data are not consistent with the crop-specific nutrient uptake rates presented in Table A-C1 [pg. 33]. It is also not clear how, or if, the A-5ax tables are used in calculating field-specific rates as the information in the applicable table does not appear to be used in the Example Nutrient Budget.

- Does the plan include the outcome of a field-specific N and P transport risk assessment? ☒ Yes ☐ No
The P Index calculations are shown in Appendix A for all land application sites identified in the NMP. However, the calculations may not be consistent with the land application protocols described in the permit, with respect to the method of land application. The P Index analyses provided in Appendix A for each field include P risk ratings based on incorporation of manure within 7 days after application for many of the fields, including fields that are not designated as liquid waste application sites. In contrast, the plan appears to use a volatilization rate for solid manure that reflects incorporation 7 or more days after application (see discussion below in the item that evaluates the methodology).

The NMP specifies that "There are several BMPs that could be applied that would change the index rating. There are several fields that have berming to prevent surface runoff from leaving the fields. In order to receive credit for this BMP the berming will need to be evaluated..." The NMP goes on to note that "any BMP credits will be documented in the plan as part of the facility record keeping." [pg. 34]. This is inconsistent with the permit, which requires that changes to the NMP must be submitted to EPA. Further, if

an NMP change results in a change to the P index rating, as described in the quoted text from the NMP, such that the maximum amount of N or P to be applied would also change, that would constitute a substantial change to the NMP, as described in the permit.

- Does the plan identify the basis/rationale for determining an N-based or P-based application rate for each field? ☒ Yes ☐ No

What is the basis?

- ☐ Soil test method ☐ Soil phosphorus threshold
☒ Phosphorus Index ☐ Other _____

- Does the plan identify fields where land application is N-based and where it is P-based? ☒ Yes ☐ No

The NMP includes the outcomes of the phosphorus risk index analysis for 28 fields.

- For P-based fields, does the plan include the use of multi-year P application? ☒ Yes ☐ No

If yes,

Is multi-year P application limited to fields that do not have a high potential for P runoff to surface water? ☒ Yes ☐ No

The NMP states, "Based on the table above a corn crop will utilize 5.5 tons of manure a year at the crop uptake rate of P₂O₅. Since it is difficult to apply at this level a higher rate can be used to apply 2 or more years of phosphorous to a field to reduce the frequency of application to a field and the impacts of vehicle traffic and compaction to the soils. This can only be done if the Phosphorous Index would allow the higher rate." [pg. 32]. However, it is not clear how this would work in practice because the P-based rate limitations originate in the P Index.

Is the application rate limited to the annual crop N requirement? ☐ Yes ☒ No

The information presented in the Manure Application Rates and Cropping Plan sections of the NMP suggests, but does not explicitly state, that application rates would be limited to the annual crop N requirement.

Is additional P application planned only after the amount applied in the multi-year application has been removed through crop uptake and harvest? ☐ Yes ☒ No

This is not explicitly stated in the NMP.

- Does the plan identify the appropriate crop N and P removal rates or nutrient recommendations (including for alternative crops, if included in plans using the narrative rate approach)?... ☐ Yes ☐ No ☒ Unknown

The permit requires that the NMP include annual nutrient budgets developed in accordance with the University of Idaho Fertilizer Guides or related University of Idaho Crop Production Guide. The NMP states that nitrogen recommendations from the soil analysis lab will be used to calculate manure application rates; the reviewer could not determine whether these recommendations would meet the permit requirement. The plan includes N and P upake rates for alfafa, corn silage, triticale, barley, pasture, beets, wheat, and potatoes [Table A-C1, pg. 33], but the source for these rates is not provided. The P uptake rates provided in the NMP appear to be consistent with those in the University of Idaho guides, where provided.

The NMP states that "The annual nitrogen budget will be developed using Stukenholtz Laboratory Recommendations. Lab Recommendations are based on University of Idaho methods and independent data sources from the labs [sic] research." The reviewer evaluated the Example Nutrient Budget in Appendix A of the NMP to determine whether the Stukenholtz Laboratory Recommendation is consistent with University of Idaho guidance. The Example Nutrient Budget calculates application rates for a corn silage crop in the field Dairy East. The Pacific Northwest (PNW) Extension guidance for corn silage (PNW0615) provides recommended fertilizer N rates based on a pre-sidedress soil nitrate test. For the field Dairy East, the soil NO₃-N test result from the lab report is 14 ppm; the corresponding fertilizer N rate in the PNW guidance (Table 3) is 130 - 180 lbs/acre. The Example Nutrient Budget calculation uses the recommended rate of 210 lbs/acre nitrogen from the Stukenholtz Lab report, 17% higher than the PNW Extension recommendation in the PNW fertilizer guide.

The reviewer notes that the PNW guide does not provide a phosphorus uptake rate for corn silage that could be used for comparison against the value provided in Table A-C1, which is used in the Example Nutrient Budget. The table below compares the P₂O₅ uptake rates in Table A-C1 with phosphorus

recommendations from University of Idaho (including PNW Extension) guidance. The rates identified in the NMP are consistent with, or less than, the crop uptake or removal rates in the fertilizer guides, where provided. The reviewer did not compare the N uptake rates in table A-C1 with University of Idaho fertilizer guides as the NMP indicates that the Stukenholtz Lab recommendations, and not the uptake rates in the NMP, will be used for nitrogen budgeting.

Crop	Table A-C1 P ₂ O ₅ Uptake Rate (lbs/acre)	Fertilizer Guide P ₂ O ₅ * (lbs/acre)	Notes	Reference
Alfalfa	84.9	128	8 lb P removal per ton of alfalfa hay	CIS1102
Triticale	39.7	46.7	Removal rate; NMP uses book value of 0.34% P, guide recommends 0.4% may be more appropriate for older animal enterprises with high soil test P	BUL869
Barley	45.3	Not provided***		BUL742 CIS1082
Pasture	46.4	Not provided***		CIS392
Beets	61.9	~60	P ₂ O ₅ uptake from Fig. 1 in linked resource	BUL935
Wheat	63.3	Not provided***		BUL986 BUL980 BUL979 BUL984
Potatoes	52.0	145		Daily Nutrient Use in Potatoes

*Converted from P where necessary, for comparison. $P_{2O5} = P * 2.29$

**Sources provided through U of I [Crop Requirements and Nutrient Sources](#) website

***Although several do not provide P uptake or removal rates, the fertilizer guides generally do provide P application rates. In most cases, the fertilizer guides recommend adding no phosphorus to fields with soils that have high soil test phosphorus, which is generally the case for the land application sites at the dairy.

Does the plan take into account other sources of nutrients used at the operation ☒ Yes ☐ No

If yes, what other sources of nutrients have been accounted for?

- | | |
|--|---|
| <input type="checkbox"/> Commercial fertilizer | <input type="checkbox"/> Biosolids |
| <input type="checkbox"/> Bedding | <input checked="" type="checkbox"/> Legume credits |
| <input checked="" type="checkbox"/> Wastewater | <input checked="" type="checkbox"/> Previous manure application |
| <input checked="" type="checkbox"/> Compost | <input type="checkbox"/> Irrigation water |
| <input type="checkbox"/> Other | |

If the N content of the irrigation water source for the dairy is significant, then the nitrogen added through irrigation should also be considered when calculating nitrogen application rates.

- For plans using the narrative rate approach, does the plan clearly articulate the **methodology** used to account for the following? ☐ Yes ☒ No (check each that is addressed in the NMP methodology)

- | | |
|--|---|
| <input checked="" type="checkbox"/> Soil test results | <input checked="" type="checkbox"/> The form and source of manure |
| <input checked="" type="checkbox"/> Credits for all plant available N in the field | <input checked="" type="checkbox"/> The timing and method of land application |
| <input checked="" type="checkbox"/> The amount of N and P in the manure to be applied | <input checked="" type="checkbox"/> Volatilization of N |
| <input checked="" type="checkbox"/> Consideration of multi-year P application | <input checked="" type="checkbox"/> Mineralization of organic N |
| <input checked="" type="checkbox"/> Accounting for all other additions of plant available N and P to the field | |

The NMP addresses each element of the methodology listed above, but not all are clearly described. Potential issues or needed clarifications are highlighted in the notes below. In addition to any potential clarifications for individual elements of the methodology, the reviewer notes one overarching concern. The methodology, and the demonstration of the methodology in the Example Nutrient Budget, combine nitrogen

volatilization during application, nitrogen retained after denitrification in the soil, and first year nitrogen availability from mineralization into a single "net availability" factor (24% for liquid manure sources and 18% for solid manure sources). This factor is then applied to the manure test results when calculating land application rates. The combination of these three factors may be problematic. First, the denitrification factor is site-specific whereas volatilization losses and mineralization vary with the manure form and source (and application method, which is based on the manure form); combining these factors may be reasonable, but the NMP does not contain sufficient information (i.e., soil organic matter content for all fields) to support this conclusion. Second, the three factors are meant to be applied to different fractions of the nitrogen present in manure. Applying all factors to the total N value from the manure analysis, as appears to have been done in the example calculation, may underestimate the amount of nitrogen available in solid manure, potentially resulting in overapplication of nitrogen.

First, nitrogen losses from volatilization and nitrogen mineralization rates vary with manure form and management. Based on the manure storage and handling descriptions in the NMP, liquid waste is stored, managed, and land applied handled similarly for the various storage structures, as is solid manure. Therefore, it is reasonable to apply the same factors for volatilization losses and mineralization to all manure sources, with variation only for the form of manure (solid vs. liquid). However, denitrification losses are site specific; the denitrification rates vary with soil organic matter content and drainage class. Based on the NRCS Soils Information provided in Appendix H of the NMP, all soils at the facility are well-drained. However, it is unclear whether the soil organic matter is consistent across all land application sites. Based on the soil test results provided for the Example Nutrient Budget, the Dairy East field has an organic matter content of 5.93%. Using NRCS AWMFH Table 11-8 provided in the NMP [pg. 28], the denitrification rate is 20%, which is consistent with the retention factor used in the net availability calculation. (Note that the table footnote suggests doubling the value for manure N; however, keeping the table value – assuming more nitrogen is retained – contributes to a conservative estimate in the land application rate calculations.)

Second, the net availability factor appears to be applied to the total N value from the manure nutrient analysis. This appears to be appropriate for the application retention factor and the mineralization factor, as presented in AWMFH Tables 11-6 [pg. 28] and 11-9 [pg. 29], respectively. However, the denitrification factor should be applied only to the inorganic fraction. Applying the denitrification factor to the total nitrogen value could underestimate the amount of nitrogen retained, potentially resulting in overapplication of nitrogen.

- **Credits for plant available N in the field:** The NMP acknowledges that the annual nutrient budget must account for previous crop nitrogen credits for legume crops and organic nitrogen and debits for residue management, and states that "Crop needs will be calculated by subtracting or adding credits/debits from crop needs" and "Soil nutrients will then be subtracted from the plant needs to determine the net Crop Nitrogen estimate for the season." [pg. 35]. However, the Example Nutrient Budget in Appendix A does not follow the protocol described in the NMP for determining available nitrogen in the soil. Instead, the crop nitrogen recommendation is based on the nitrogen soil test result. The Example Nutrient Budget states that "The Lab sample has already taken into account the available nitrogen in the soil, previous crop credits or debits." In the example calculation, the soil test was collected in October, and the example calculations are for a planned corn crop, which presumably will be planted the following spring. The NMP should be revised to accurately reflect the protocols and calculations that will be used to determine application rates.
- **Consideration of multi-year P application:** As described above, the plan provides for multi-year P application, but it is not clear how or under what circumstances the provision would be implemented.
- **Accounting for all other additions...:** As mentioned above, the NMP does not account for the N content of irrigation water; this should be added if irrigation water is a significant source of plant available nitrogen.
- **Form and source:** The Manure Application Rates section of the NMP [pg. 27] describes how the facility will account for nitrogen losses due to storage (will be accounted for in manure samples taken immediately before land application; storage losses from NRCS AWMFH Table 11-5 to be applied for applications made "months after a sample analysis.").
- **Timing and method, N volatilization:** The Manure Application Rates section of the NMP [pg. 27] includes tables that account for volatilization losses based on the method of application and for denitrification in the soil. The "application N retention" (representing volatilization) component used to calculate the net availability factor for lagoons, as described above, appears to be appropriate based on the application methods described in the NMP and the P Index calculations. However, the application retention value for solid manure (50%) reflects manure that is broadcast and incorporated 7 or more days after application. This volatilization rate is not consistent with the solid manure application

methods in the NMP P Index calculations. As described in the Conservation Practices section of the NMP, "All fields may receive solid manure applications at some point during this NMP cycle... Applications are made using end exhaust trucks..." (i.e., broadcast) [pg. 36]. As stated above, the P Index analyses provided in Appendix A for each field include P risk ratings based on incorporation of manure within 7 days after application for many of the fields, including fields that are not designated as liquid waste application sites.

- **Mineralization of organic N:** The 1st year availability component of the net availability factor calculation appears to be appropriate for the manure type and management described in the NMP.

- Does the plan identify the application method? ☒ Yes ☐ No
If yes, what method is used: ☒ Surface applied ☐ Injected ☒ Incorporated

- Does the plan identify appropriate volatilization rates based on the method of application? ☐ Yes ☒ No

The volatilization rate used for solid manure is not consistent with the solid manure application methods in the NMP P Index calculations. See "Timing and method, N volatilization" in the methodology discussion above.

- Does the plan include the application of wastewater to fields via an irrigation system? ☒ Yes ☐ No
If yes:

Does the plan identify the type of irrigation system? ☒ Yes ☐ No

Does the plan include provisions to minimize ponding or puddling of wastewater on land application fields? ☒ Yes ☐ No

Does the plan address the management of drainage water to prevent surface or groundwater contamination? ☐ Yes ☒ No

The Conservation Practices section of the NMP states that the entire farm is sprinkler irrigated with "systems designed to match the infiltration rate of the field to minimize runoff and maximize use of water for irrigation." [pg. 35].

- Does the plan include specific restrictions or adequate management practices to prevent water pollution from the application of manure/wastewater to flooded, saturated, frozen, or snow-covered ground? ☒ Yes ☐ No

The NMP includes the prohibition on land application to frozen, snow-covered, and saturated soils, as stated in the general permit [pg. 35].

- Does the plan address inspection and maintenance of land application equipment? ☒ Yes ☐ No

The NMP includes language from the permit; it is not site-specific [pg. 6]. Plan revisions and/or site-specific requirements could identify the equipment (e.g., pivot sprinklers or other types of sprinklers located in specific fields, end exhaust truck(s)) to be inspected and the frequency of inspection.

- Does the plan require periodic calibration of manure application equipment? ☒ Yes ☐ No

The NMP includes general calibration language, it is not site-specific.

- Are the application rates identified in the plan appropriate? ☐ Yes ☐ No ☒ Unknown

Notes for Minimum Practice: Protocols for Land Application of Manure and Wastewater; Rate Determination/Nutrient Application Information

In addition to the items identified above, the NMP doesn't include field-specific rates or an initial nutrient budget for each field, and does not specify what crops will be grown for each field.

Minimum Practice: Record Keeping

Identify the records that the plan indicates will be maintained at the facility.

Production Area Records

- ✓ Weekly inspections of stormwater and runoff diversion devices and devices for channeling contaminated stormwater to wastewater containment structures ☒ Yes ☐ No
- ✓ Weekly inspections of manure, litter, and process wastewater impoundments ☒ Yes ☐ No
- ✓ Weekly storage facility wastewater level, as indicated on depth marker ☒ Yes ☐ No
- ✓ Daily water line inspections ☒ Yes ☐ No
- ✓ Actions taken to correct deficiencies identified as a result of daily and weekly inspections ☒ Yes ☐ No
- ✓ Manure/wastewater storage—date of emptying, level before emptying, and level after emptying, or quantity removed (dry manure) ☐ Yes ☒ No
- ✓ The date, time, and volume of any overflow ☒ Yes ☐ No
- ✓ Records documenting that mortalities were not disposed of in any liquid manure or process wastewater system and that mortalities were handled to prevent the discharge of pollutants to surface water ☒ Yes ☐ No
- ✓ On-site precipitation ☐ Yes ☒ No
- ✓ Animal Inventory ☐ Yes ☒ No

Land Application Records

- ✓ Manure and wastewater sample nutrient analysis test methods and results that will be used to calculate land application rates ☒ Yes ☐ No
- ✓ Soil sample analysis test methods and results that will be used to calculate land application rates ☒ Yes ☐ No
- ✓ Manure and wastewater application equipment inspection log ☒ Yes ☐ No
- ✓ Maintenance log of all equipment necessary to control discharge and meet permit requirements (e.g., maintenance of land application equipment) ☐ Yes ☒ No
- ✓ Annual calculation of the maximum amount of manure or wastewater to be land applied, prior to application ☒ Yes ☐ No
- ✓ Crop planting/harvest dates by field or CMU ☐ Yes ☒ No
- ✓ Crop type and yield by field or CMU – bushels/acre (seasonally) ☐ Yes ☒ No
- ✓ For each land application event, the date, rate (tons of manure or gallons of wastewater/acre or pounds of N and P/acre), weather conditions during and for 24 hours before and after application, application method, and equipment used by field or CMU (daily during application) ☒ Yes ☐ No
- ✓ The total amount of N and P applied to each field, including calculations ☒ Yes ☐ No
- ✓ Lease/Rental/Access Agreements for all land not owned by the operator ☐ Yes ☒ No

Off-site Transfer of Manure and Wastewater Records

- ✓ Date of each transfer ☒ Yes ☐ No
- ✓ The name and address of the recipient (for each transfer) ☒ Yes ☐ No
- ✓ Quantity transferred (for each transfer) ☒ Yes ☐ No
- ✓ Documentation that the most current nutrient analysis was provided to the recipient ☒ Yes ☐ No

Other Records

- ✓ Does the plan require that any additional records be maintained at the facility? ☐ Yes ☒ No
If yes, what are those records? _____
- ✓ Does the plan include an emergency action plan to address spills and catastrophic events? ☒ Yes ☐ No

Notes for Minimum Practice: Record Keeping

The responses in this Record Keeping section are based on the following sections of the NMP: Requirements for the Transfer of Manure, Litter, and Process Wastewater [pg. 39] and Records, Reporting, Monitoring And Notification [pg. 41 – 43]. These sections include record keeping requirements verbatim from the permit and do not convey any site specific information to further clarify what will be documented, how the information will be recorded, how frequently, etc.

The NMP includes another section titled “Record Keeping Requirements” [pg. 5 – 7], but that section includes permit language, verbatim, from the Effluent Limitations and Standards sections of the permit, sections II.A.2 and II.B, which do not include record keeping requirements.

Part C – Determination of Plan Adequacy

[Note: This section is to be used by NMP reviewer to evaluate the overall adequacy of the plan based on the information in Parts A and B and does not necessarily reflect information expected to be contained in the NMP.]

- Does the plan adequately address the storage, handling, and application of manure and wastewater to prevent the discharge of pollutants to waters of the United States? ☐ Yes ☒ No

Based on the information in the NMP, it appears that the facility has adequate storage capacity for the liquid and solid manure and compost generated on the site. However, it is not clear that the facility has adequate land to appropriately utilize the nutrients in the wastewater, which could impact storage capacity if excess wastewater builds up in the ponds. In addition, the NMP does not specify O&M procedures for waste storage structures or for the berm that diverts stormwater away from the production area.

- Is the plan consistent with the technical standards for nutrient management established by the Director with regard to protocols for manure and soil testing and land application protocols including nutrient transport risk assessment methods and methods and data used to determine application rates? ☐ Yes ☐ No ☒ Unknown

The NMP lacks adequate field-specific information (crop rotations, yield goals, planned nutrient applications, conservation practices, etc.) to determine with any certainty whether it is consistent with the requirements and technical standards identified in the permit and the requirements of the federal CAFO regulations. The reviewer notes, however, that although the regulations require this field-specific information to be included in the plan, the permit requirements are less explicit.

- Have there been past discharges to waters of the United States from the facility? ☐ Yes ☐ No ☒ Unknown

Not evaluated/outside the scope of this review

If yes, does the plan include sufficient measures to address the cause of the past discharge and prevent future discharges? ☐ Yes ☐ No

- Does the plan require revision? ☒ Yes ☐ No

If yes, what specific components of the plan require revision?

- The NMP does not include O&M procedures for storage structures. [Permit section III.A.2.a]
- The NMP documents that the facility cannot confirm compliance with NRCS Appendix 10D and IDAPA 02.04.14.030.01 for all storage structures and has not used Tech Note #23 to evaluate any storage structures. Until this deficiency is resolved the facility does not comply with this permit requirement. [Permit section III.A.2.a.ii]
- The plan contains insufficient information for reviewers or the general public to identify the field-specific "terms of the NMP" with respect to land application rates [40 CFR 122.42(e)(5)].
- Other elements of the plan could be clarified to better demonstrate conformance with the permit and regulatory requirements: these are highlighted in notes throughout this checklist. For example, certain land application information is not adequately described, such as the basis for yield goals or the specific yield goals to be used. The "availability factor" calculation might underestimate the amount of nitrogen in the manure to be land applied. Additional clarification of these and other issues highlighted throughout the checklist could improve both identification of terms and the operator's ability to implement the plan in compliance with the permit.
- For some key elements (including the permit requirements derived from 40 CFR 412.37), the NMP only includes language that is cut and pasted from the permit (complete with references to other sections of the permit that do not make sense in the context of the NMP because the referenced language is not included in the NMP and the pasted language doesn't make it clear that the references are to sections of the permit). The NMP language that is pasted in from the permit is not site-specific. For example, the NMP doesn't identify which storage structures, diversions, etc. will be inspected, what specific records will be kept to document each of the NMP measures, etc.